Table 3

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Laham JL *et al*, 1994, USA	268 children aged 0–19, with apparent isolated head injuries defined by clinical and radiographic evidence in a single children's hospital. Low risk criteria for c-spine injury: capable of verbal communication and no neck pain	Retrospective cohort study	Performance of low risk criteria for excluding c-spine injury	No cervical spine injuries in the low risk group (n=135). 10 (7.5%) cervical injuries in the high risk group. (n=133) Sensitivity 100% Specificity 52%	The entry criteria of: significant head injury needing admission was made at the discretion of the PICU triage officer. GCS was not consistently recorded in these children 215 children had cervical radiographs (80%)
Viccellio P, *et al*, 2001, USA	Multicenter evaluation of 3065 children (age <18) with suspected c-spine injury who underwent clinical evaluation before c-spine radiography. Low risk criteria (Nexus criteria) were defined as absence of: (1) midline cervical tenderness, (2) painful distracting injury, (3) altered alertness, (4) neurological deficit, and (5) intoxication	Prospective cohort Study	Performance of low risk criteria for excluding c-spine injury	No child in the low risk group of 603 patients had a c-spine injury. Nexus criteria identified all cases of cervical injury diagnosed by radiography Sensitivity 100% (CI 87.8% to 100%) Specificity 19.8%	Number of children with cervical spine injury under nine was very low (only 4) Total number of children with cervical injury was only 30 (0.98%), therefore, CI for sensitivity was wide (87.8% to 100.0%) Caution is suggested for applying the Nexus criteria for children under 9 years.
American Association of Neurological Surgeons and the Congress of Neurological Surgeons, 2002, USA	Search of Medline (1966–2001) in the following subject headings: "spinal injuries" and "child" were reviewed with "cervical vertebrae", "spinal injuries" and "child". Altogether, 58 relevant articles were identified	Systematic review	Guidelines for the management of acute cervical spine and spinal cord injuries	In children experiencing trauma who are alert, conversant, have no neurological deficit, no midline cervical tenderness, no painful distracting injury and not intoxicated, cervical spine radiographs not recommended. This is a recommendation from grade 3 evidence papers except Nexus paper, which is grade 2	Search strategy is not reproducible. No mention of searching the grey literature or contacting experts for papers.

view radiography but you realise that getting the odontoid peg view can be very difficult in non-compliant children. You wonder on what evidence this specific guideline was based.

Three part question

In [children under 9 years old with suspected cervical spine injury] is [the odontoid peg view needed in addition to lateral and antero-posterior views] to [radiologically clear the cervical spine]?

Search strategy

Medline 1966–12/02 using the OVID interface. [(exp Spinal Cord Injuries) OR (spinal cord injur$.mp) OR (cervical spine injur$.mp) OR (spinal fractur$.mp) OR (exp x-rays) OR (x-rays.mp) OR (radiograph$.mp)] AND [(exp odontoid process) OR (odontoid.mp)] AND [BestBETs Paediatric filter] LIMIT to Human AND English.

Search outcome

Altogether 156 papers were identified of which two were relevant. The reference list of the guidelines were also searched but these were the only two papers of direct relevence. The two papers and the guidelines are summarised in table 4.

Comment(s)

The comprehensive review of the literature by the American Association of Neurological surgeons in 2002 come to the conclusion that odontoid peg views in the under 9 age group are unnecessary. However, Swischuk *et al* in their survey of 432 paediatric radiologists report that they have identified 46 fractures, seen on the odontoid peg view that could not be seen on the lateral view. The American Association have set the current best evidence guidelines in this area but it should be remembered that they warn that these do not represent diagnostic standards and caution should be used in their application.

▸ CLINICAL BOTTOM LINE

Guidelines on cessation of the odontoid peg views in the under 9 age group should be viewed with great caution.

Swischuk LE, John SD, Hendrick EP. Is the open-mouth odontoid view necessary in children under 5 years? *Pediatr Radiol* 2000;**30**:186–9.
Buhs C, Cullen M, Klein M, *et al*. The pediatric trauma c-spine: is the "odontoid" view necessary? *J Pediatr Surg* 2000;**35**:994–7.
American Association of Neurological Surgeons and the Congress of Neurological Surgeons. Management of pediatric cervical spine and spinal cord injuries. *Neurosurgery* 2002;**50** (suppl 3):S85–99.

Conservative mangement of asymptomatic cocaine body packers

Report by Debasis Das, *House Officer in Surgery*

Checked by Baha Ali, *Senior Clinical Fellow in Emergency Medicine*

Abstract

A short cut review was carried out to establish whether asymptomatic cocaine body packers can be managed conservatively. Altogether 171 papers were found using the reported search, of which four presented the best evidence to answer the clinical question. The author, date and country of publication, patient group studied, study type, relevant

Table 4

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Swischuck L *et al*, 2000, USA	984 questionnaires submitted to paediatric radiologists (432 respondents) to determine whether odontoid views were included in the imaging protocols and how often odontoid fractures were missed on lateral views and detected on odontoid views in children under 5 years	Survey	Concept that the odontoid view might not be necessary in children under 5	Of the 432 respondents, 161 (37%) indicated that an open mouth odontoid view was not routinely included in their imaging protocol Of the 271 respondents who routinely use the open mouth odontoid view, 122 (45%) would request a CT if this view was too difficult to obtain 28 of the 432 respondents (7%) reported missing a total of 46 fractures on the lateral view that were detected on the odontoid view	Only 44% of radiologists responded Recollection of a missed fracture is not a reliable method of data collection Emergency physicians, not radiologists are the cohort of doctors who are actually most likely to recollect missed fractures such as these
Buhs C *et al*, 2000, USA	Multi-institutional review of all paediatric patients in the 0–16 age group with a documented cervical spine injury during a 10 year period from 1987–1997 at 4 hospitals. 51 children with cervical spine injury were identified from the medical records	Retrospective cohort study	Identification of a cervical fracture on odontoid peg view alone.	In no child in the 0–8 year old group was the odontoid peg view useful to make a diagnosis of fracture. Also in 63% of these children, the film was of such poor quality that the dens could not be evaluated In the 9–16 year-old group only 1 of 36 children (3%) was the open mouth view the diagnostic view (a Type III odontoid injury)	Total number of children with cervical injury was only 51 This study looks retrospectively at positive fractures only, no cohort of odontoid views was analysed, thus limiting greatly the utility of this study
American Association of Neurological Surgeons and the Congress of Neurological Surgeons, 2002, USA	Search of Medline (1966–2001) in the following subject headings: "spinal injuries" and "child" were reviewed with "cervical vertebrae", "spinal injuries" and "child". Altogether, 58 relevant articles were identified	Systematic review	Guidelines for the management of acute cervical spine and spinal cord injuries	Insufficient evidence to support diagnostic standards however the following are recommended: In children <9 years of age who have experienced trauma and are non-conversant, or have neurological deficit, an altered mental status, neck pain, or a painful distracting injury, are intoxicated, or have unexplained hypotension it is recommended that anteroposterior and lateral cervical spine radiographs be obtained.	Search strategy is not fully described in this paper Note authors came to their recommendations largely on the two other studies summarised above

outcomes, results and study weaknesses of these best papers are tabulated. A clinical bottom line is stated.

Clinical scenario

You are called to see a young adult male who is accompanied by two members of Her Majesty's Customs and Excise. They tell you that he is under suspicion of trying to smuggle drugs into the country and that he may have done this by ingesting packets of cocaine. Physical examination is unremarkable, but abdominal radiography does reveal multiple, oval foreign bodies in the bowel. You know that such "body packers" might well develop intestinal obstruction and/or get potentially fatal cocaine toxicity from leakage of the contents of these packages in their bowels. You wonder whether to simply leave the patient as he is and observe him for signs of obstruction and/or pending cocaine toxicity, intervene conservatively and do the latter as well, or do something more aggressive to remove the packages from the patient's intestines.

Three part question

In [asymptomatic patients who have swallowed packets of cocaine in order to smuggle them across borders] is [conservative management] effective at [preventing the morbidity and mortality associated with body packing]?

Search strategy

Medline 1966–12/02 using the OVID interface. [exp cocaine OR exp cocaine-related disorders OR exp crack cocaine OR "cocaine".mp] AND [exp foreign bodies OR exp gastrointestinal system OR "packet".mp OR "INGESTED".mp] LIMIT to human AND English Language.

Search outcome

Altogether 171 papers found of which 111 were irrelevant and a further 57 papers were unsuitable for inclusion due to either having insufficient patient numbers to be useful (usually single/double case reports—range: 1–7 patients, n=36 papers, including five letters/editorials), or for being irrelevant to the other core issue of how to actually manage cocaine packet ingestion (n=19 papers—usually on only investigating body packing). In addition one more relevant paper, not yet indexed on Medline was found The four papers are shown in table 5.

Comment(s)

It has generally become accepted that cocaine body packers who show signs of cocaine toxicity or gastrointestinal obstruction need emergency surgery. Additionally, when packets show signs of in vivo degradation (passing pieces of sloughed packet wrappings or actual packets with deteriorated packaging) emergency surgery may also be warranted.

The general management plan in asymptomatic cocaine body packers would seem to be conservative management consisting of mild laxatives and light solid or clear liquid diet with close monitoring and intravenous access maintenance throughout. Treatment usually ceases with the passage of at

Table 5

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
McCarron MM and Wood JD, 1983, USA	48 suspected smugglers with ingested intra-corporeal cocaine packets (number of packets per patient: 15–175)	Prospective cohort	Complete passage of packets per rectum Emergency surgery Complications of conservative management	47 patients 1 patient with obstruction 2 patients developed cocaine toxicity due to packet	
Caruana DS *et al*, 1984, USA	50 patients with ingested intra-corporeal cocaine packets. (number of packets passed per patient: 54–182)	Retrospective cohort	Complete passage of packets per rectum using conservative management. Elective surgery Complications of conservative management	44 patients 6 patients (their own choice) 3 patients required emergency surgery for obstruction	Treatment environment unknown Time from admission to onset of symptoms in the three patients who developed complications unknown
Aldrighetti L *et al*, 1996, Italy	61 asymptomatic suspected smugglers with ingested intra-corporeal packets of cocaine (number of packets ingested per patient: 52–117)	Retrospective cohort	Complete passage of packets per rectum using conservative management. Complications of conservative management	61 patients 2 patients required emergency surgery: 1 obstruction, 1 cocaine toxicity (on day 3 of admission	Treatment environment unknown Time from admission to onset of symptoms in the obstructed patient unknown
Bulstrode N *et al*, 2002, UK	180 suspected smugglers with ingested intra-corporeal packets of contraband. (number of packets per patient: 2–217)	Retrospective cohort	Complete passage of packets per rectum using conservative management	144 asymptomatic body packers	Several key details unknown, for example, exact management of the 144 packers who were not admitted and discharge criteria

least two packet free stools, with or without supporting radiographic data (abdominal radiograph/ KUB), and only McCarron and Wood suggest using suppositories to obtain non-obstructing, intra-rectal packets.

That said, details such as management environment (intensive care/high dependency unit, emergency department, or general ward?) still remain unclear, and because none of the series mentioned above are prospective, randomised control trials, the validity of their results can also be called into question.

▸ CLINICAL BOTTOM LINE

The best evidence available suggests that asymptomatic cocaine body packers can be managed conservatively until they have completely passed their packets. Close clinical observation in the meantime allows for the early detection of patients developing complications that may require emergency surgery.

McCarron MM, Wood JD. The cocaine body packer syndrome. Diagnosis and treatment. *JAMA* 1983;**250**:1417–20.
Caruana DS, Weinbach B, Goerg D, *et al*. Cocaine-packet ingestion. Diagnosis, management, and natural history. *Ann Intern Med* 1984;**100**:73–4.
Aldrighetti L, Paganelli M, Giacomelli M, *et al*. Conservative management of cocaine-packet ingestion: experience in Milan, the main Italian smuggling center of South American cocaine. *Panminerva Med* 1996;**38**:111–16.
Bulstrode N, Banks F, Shrotria S. The outcome of drug smuggling by 'body packers'—the British experience. *Ann R Coll Surg Engl* 2002;**84**:35–8.

Acute myocardial infarction in cocaine induced chest pain presenting as an emergency

Report by Simon Carley, *Specialist Riegistrar*
Checked by Baha Ali, *Senior Clinical Fellow*

Abstract
A short cut review was carried out to establish the incidence of acute myocardial infarction in patients presenting as emergencies with post-cocaine chest pain. Altogether 198 papers were found using the reported search, of which eight presented the best evidence to answer the clinical question. The author, date and country of publication, patient group studied, study type, relevant outcomes, results, and study weaknesses of these best papers are tabulated. A clinical bottom line is stated.

Clinical scenario

A 32 year old man presents to the emergency department with central chest pain suggestive of cardiac ischaemia. He has had pain for 50 minutes after nasal cocaine. He is an occasional cocaine user who has not had chest pain previously. He is previously well. His 12 lead ECG is normal and he is now pain free. You see him in the resuscitation room and prescribe oral aspirin 300 mg. He is cardiovascularly stable. You admit him and do a 12 hour troponin T, which is normal. The next day a colleague suggests that there was no need to admit as he was well, had a normal ECG, had few risk factors, and that as cocaine causes spasm rather than clots he could have gone home. You wonder whether this is good advice.

Three part question

In [patients presenting with cocaine associated chest pain] what [is the incidence] of [acute myocardial infarction]?

Search strategy

Cochrane database and Medline 1966–12/02 using the OVID interface. [exp cocaine OR exp cocaine-related disorders OR exp crack cocaine OR cocaine.mp] AND [exp Myocardial Infarction OR myocardial infarction.mp OR exp Chest Pain OR chest pain.mp] LIMIT to human, English AND abstracts.

Search outcome

No relevant papers found on Cochrane library. Altogether 198 papers were found on Medline of which eight were relevant to the three part question (see table 6).

Comment(s)

The incidence of acute myocardial infarction in cocaine associated chest pain is small but significant. The ECG seems to have